

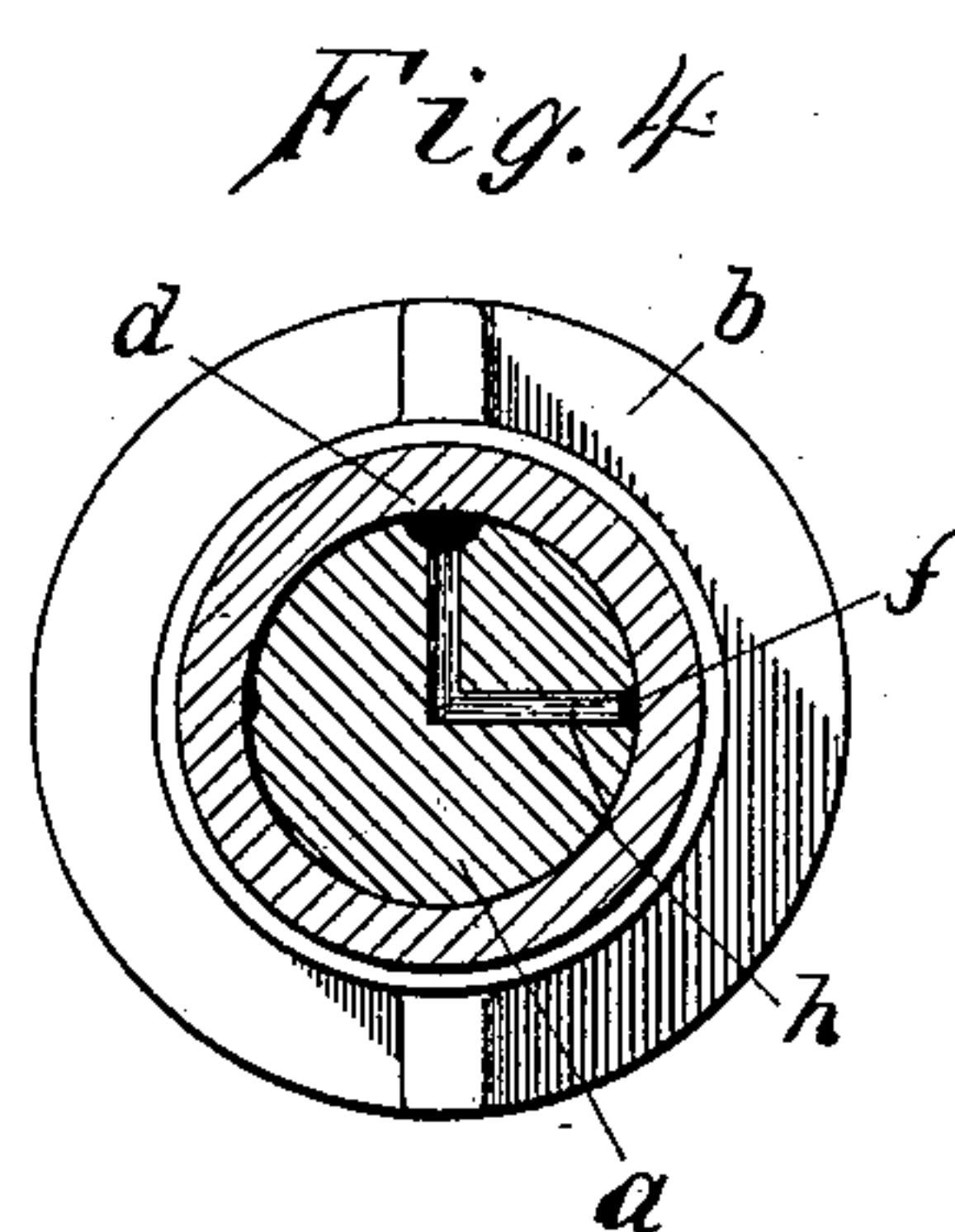
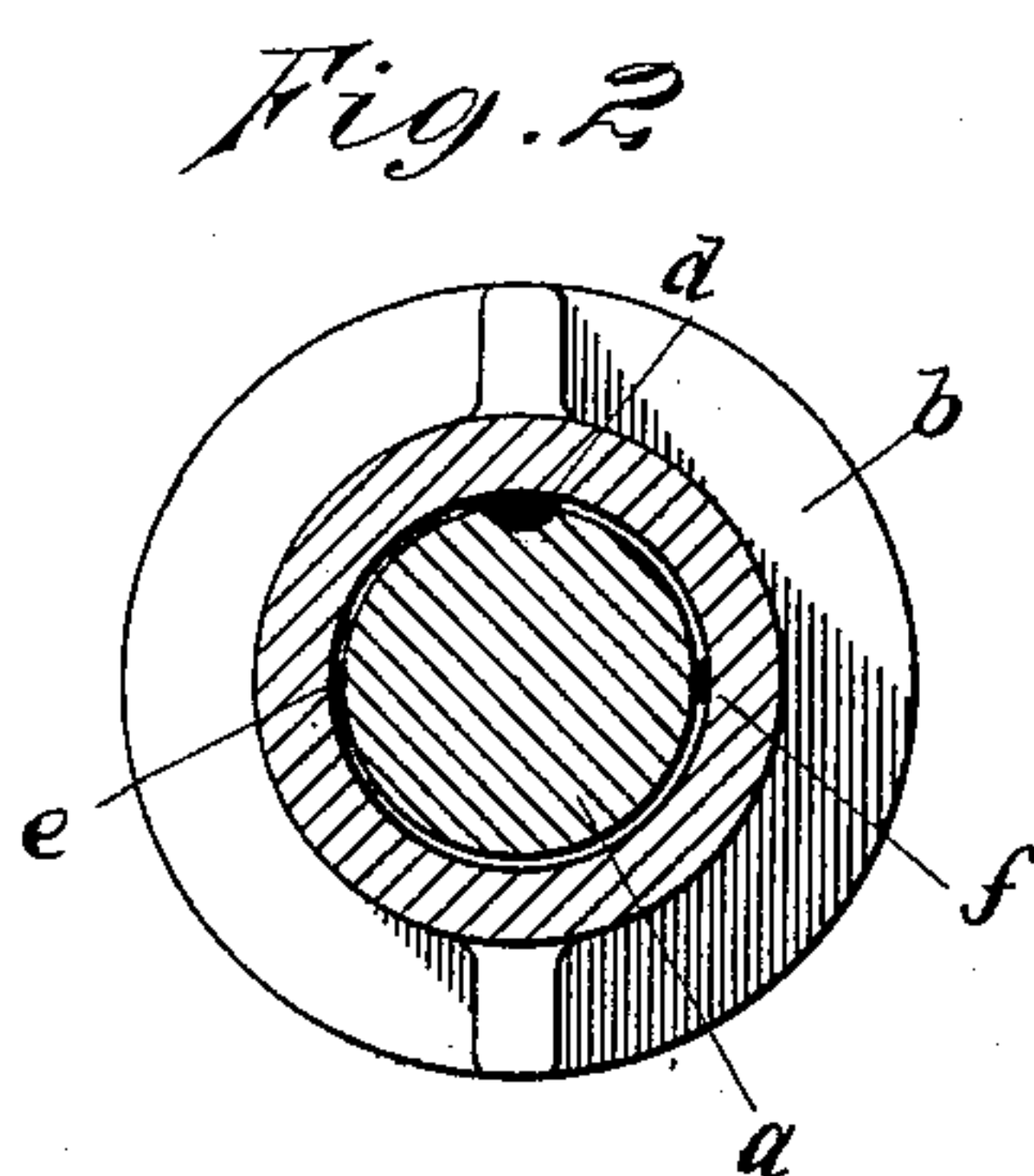
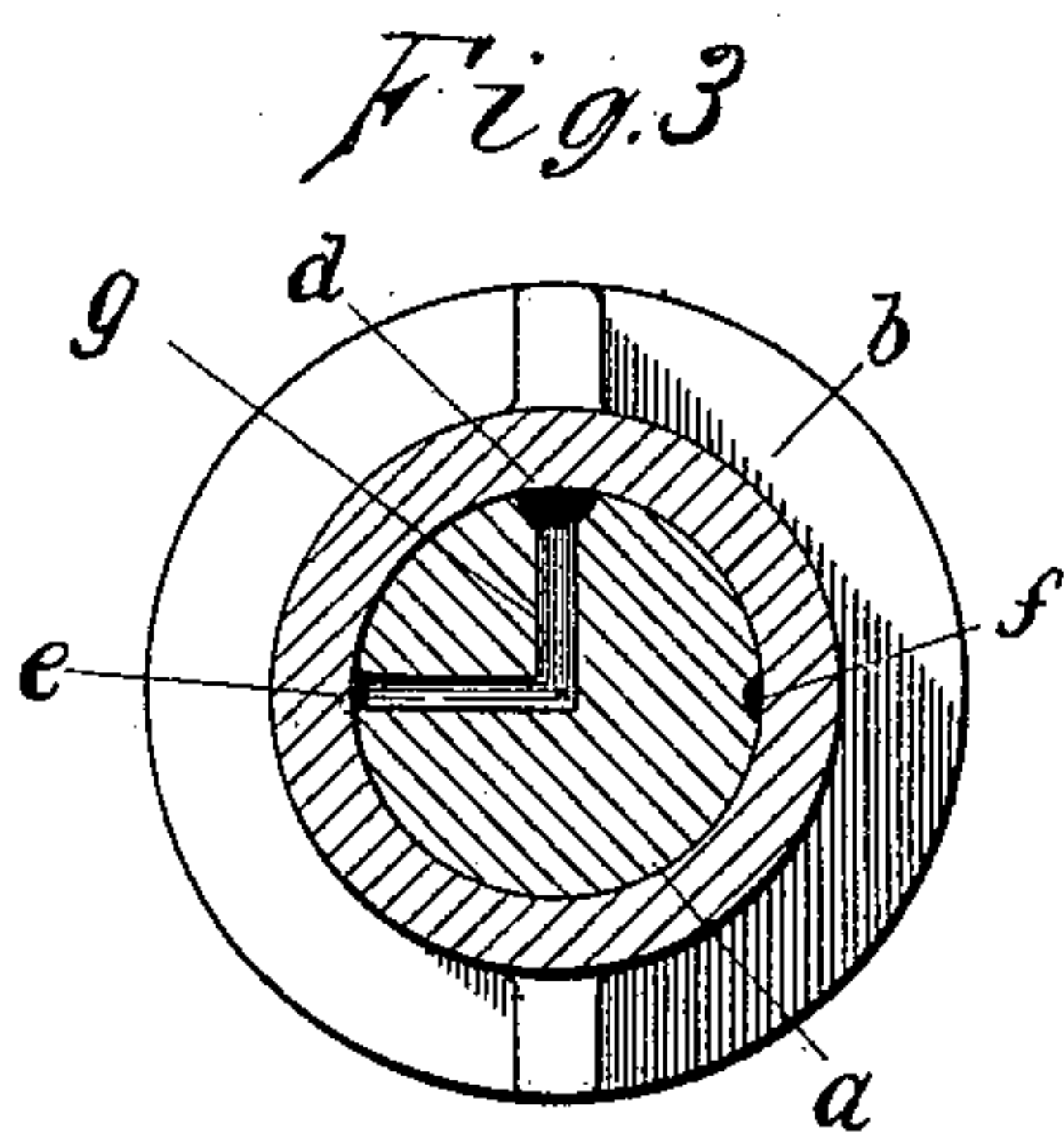
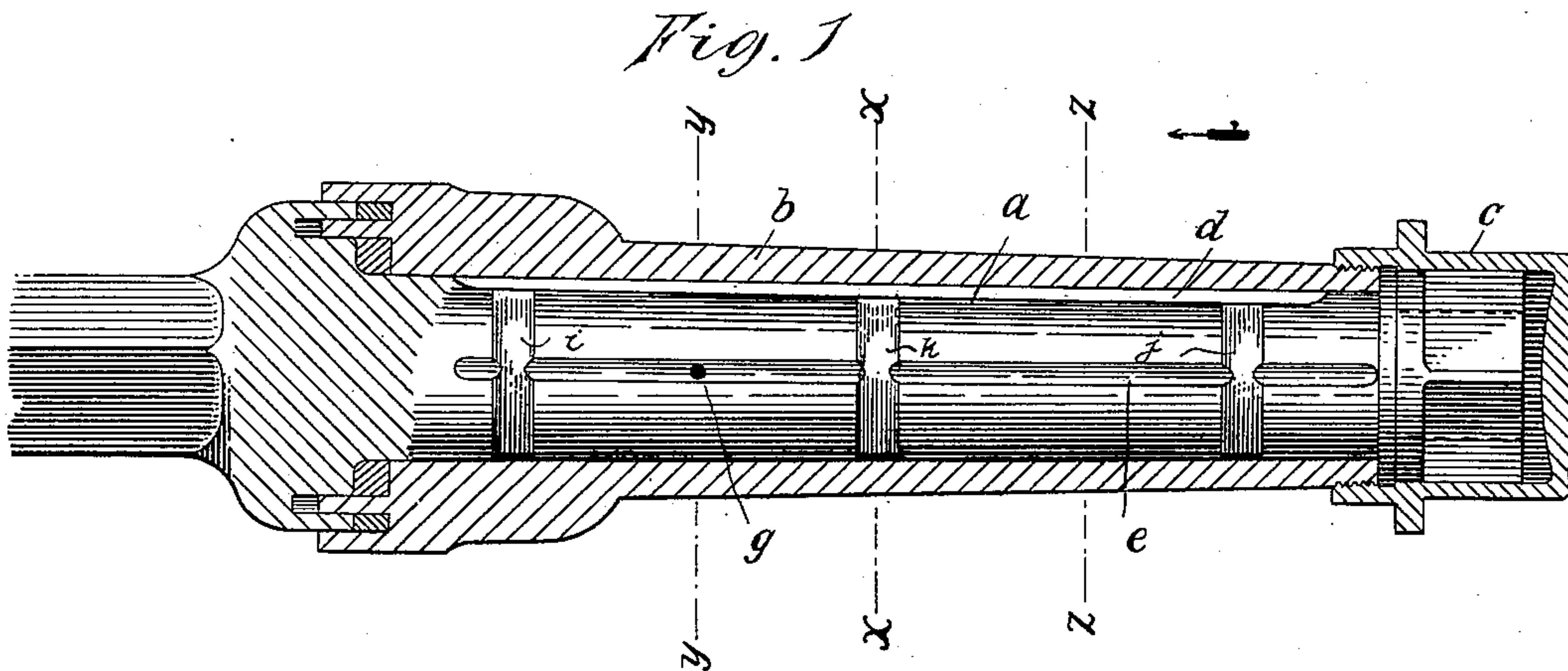
No. 614,656.

Patented Nov. 22, 1898.

E. D. IVES.  
LUBRICATING AXLE ARM.

(Application filed July 16, 1898.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

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## LUBRICATING AXLE-ARM.

SPECIFICATION forming part of Letters Patent No. 614,656, dated November 22, 1898.

Application filed July 16, 1898. Serial No. 686,110. (No model.)

*To all whom it may concern:*

Be it known that I, ELLSWORTH D. IVES, a citizen of the United States of America, residing at Norfolk, in the county of Litchfield and State of Connecticut, have invented a certain new and useful Improvement in Lubricating Axle-Arms, of which the following is a description, reference being had to the accompanying drawings, wherein—

10 Figure 1 is a view of an axle-arm embodying said improvement, the box and other appurtenances being represented as cut in longitudinal vertical section. Fig. 2 is a view in vertical cross-section of the parts shown in  
15 Fig. 1 on the plane denoted by the dotted line *x x*. Fig. 3 is a view of the parts shown in Fig. 1 in cross-section on the plane denoted by the dotted line *y y*. Fig. 4 is a view of the parts shown in Fig. 2 in cross-section on the  
20 plane denoted by the dotted line *z z*.

The object of the improvement is the production of an axle-arm for vehicles provided with certain ducts, grooves, and channels which facilitate the equal distribution of the  
25 lubricant and the long retention of the same and also serve to take up the grit or dirt which accumulates in the axle-box.

In the accompanying drawings the letter *a* designates the axle-arm, *b* the axle-box, and  
30 *c* the cap at the end. It is to be understood that the axle-box is inserted in the hub of a wheel, and in the present instance this wheel can turn in either direction.

Coming now more particularly to the present invention, the axle-arm is provided along  
35 its top with a main longitudinal groove *d*, intended to receive the oil in the first instance. Along its front and rear sides it is provided with the additional longitudinal grooves *e*  
40 and *f*, for purposes to appear hereinafter, and through its body are provided ducts *g* and *h*, respectively, near the inner and outer end of the arm and alternately connecting the main groove with the side grooves *e* and  
45 *f*, so that the oil from the main groove has initially a free downward passage to both said side grooves.

Around the body of the arm and at about the center of its length I sometimes cut a  
50 rather flat encircling channel *k*, which of course intersects all the grooves above mentioned, and in extremely long arms I may

also provide additional and similar encircling channels *i* and *j*, which are located, preferably, outside of or beyond the ducts above  
55 mentioned. The function and advantages of these channels are to permit the free passage of air from one side groove upward and back to the topmost or main groove to take the place of the oil which flows therefrom and  
60 prevent the formation of any vacuum which might retard its ready flow, and these channels will also serve in thoroughly distributing the oil to all bearing-surfaces.

In use the main groove is filled with the  
65 lubricant and the box passed onto the arm and held in position. Thereafter the wheel will ever turn in one direction, according to whether the arm in question is at the right or the left side of the vehicle, the slight turn-  
70 ing occurring in backing having practically no effect. Any given point within the box passes over the main groove and slightly above the surface of the lubricant, thence it descends on the front side of the axle-arm and takes up a  
75 small portion of the lubricant standing in the forward of the side grooves, which therefore constitutes one of the oil-grooves, and finally it passes down under the arm and up at the rear and takes up many small particles of  
80 grit, dirt, and the like always present in boxes of this character, all of which are lodged in the rearmost of the side grooves, which therefore becomes the dirt-groove. Soon this rear groove becomes filled to a considerable ex-  
85 tent (and in time completely) with such grit and the like, and the lower end of the duct leading thereto chokes almost if not completely, so that there is no longer a flow of oil from the main groove into this side groove.  
90 Still it will be clear that had the nature of the vehicle required that this wheel should turn the other way it would have been the other side groove which would have become choked with grit. Hence use will always con-  
95 vert one side groove into a dirt-groove and leave the other side groove open to act as a distributor for the oil flowing through its duct from the main groove. Meanwhile the encircling channel or channels serve their  
100 purpose, as explained above, and permit the lubricant to have a slight circulation, because of the fact that the air displaced in the side groove by the inflowing oil is free to pass up-



ward to a point above that in the main groove, as set forth.

I am aware that it is old, broadly, to form longitudinal grooves in an axle-arm, also to  
5 form encircling grooves therein; but I am not aware that the two have been combined in one device in the manner herein set out, especially when the ducts from the main groove lead alternately to the side grooves, and thus  
10 permit one of the latter to become "dead" or serve as a receptacle for the grit within the box.

What is claimed as new is—

1. The combination with an interiorly  
15 smooth axle-box, of an axle-arm having a main longitudinal oil-groove in its top, an additional longitudinal oil-groove in one side, and a longitudinal groove in the other side adapted to collect the grit or dirt, and ducts

alternately connecting said main groove re- 20 spectively with said side grooves, as and for the purpose set forth.

2. The combination with an interiorly smooth and tapering axle-box, of a tapering axle-arm therein provided with a main longi- 25 tudinal groove along its top and with additional longitudinal grooves along its sides, a pair of ducts connecting the main groove with the side grooves, one near the inner and the other near the outer end of the arm, and an  
30 encircling channel surrounding the axle-arm between the ducts and communicating with all said grooves, as and for the purpose set forth.

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